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Book Author(s): NICOLE STAROSIELSKI
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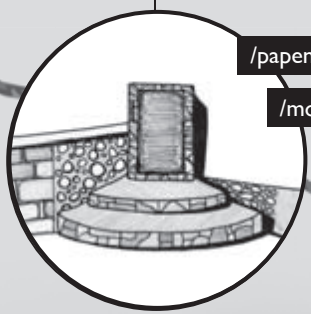

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PREFACE

edges

O‘ahu, Hawai‘i, United States

I am standing on Electric Beach, on O‘ahu’s west shore—a beach named for the large power plant towering behind it and known for regular car burglaries. Three men are casually fishing off the edge of the point. Families are having barbeques. Posing as a tourist with a camera, I crouch down to take pictures of a manhole covered in rust-colored dirt (figure P.1). Underneath the manhole, a fiber-optic cable surfaces, bringing information encoded in light waves from the other Hawaiian islands. Within thirty miles of this point, cable systems extend directly to California, Oregon, Fiji, and Guam and reach onward to Australia, Japan, and much of East Asia. Though they are at the edge of the United States and the periphery of Americans’ vision, O‘ahu’s cable landings establish Hawai‘i as a critical node in our global telecommunications networks. Manholes, such as the one beneath my feet, are some of the few sites where cable systems appear in public space. It is by looking down, rather than up to the sky, that we can best see today’s network infrastructure.

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FIGURE P.1. O'ahu cable landing.

Following the cable route toward the ocean, I find a path carved out by foot traffic, demarcating a connection between land and sea. As I turn from the water's edge to head back to the cable station, I experience a moment of disconnect. In front of me is a small cave containing hanging clothes, stockpiled chairs, and collected water. The same beach that makes possible the landing of communications cables—infrastructures that accelerate the movement of information across oceans—is also a temporary dwelling for some of the least mobile Hawaiians. When I travel up O'ahu's west shore, I meet residents who help me to make sense of the apparent contradiction. The histories of cable laying, militarization, and economic deprivation in the area are intertwined: the modes of spatial organization that have enabled O'ahu to become a communications hub have also displaced local residents to tent cities on coastal beaches. In reaction, residents have developed a territorial politics that challenges the cable companies' extensions through the shore. This is not the only place where local conflicts over territory obstruct network development. Across the Pacific, companies have to apply for extensive permits to traverse the cable landing point, and at times their projects are diverted to alternate routes or stopped altogether.

In the early 2000s, toward the end of the fiber-optic cable boom—a period of intense infrastructure building that coincided with the emergence of the Internet—Tyco Telecommunications built a station in the town of Ma'ili, sev-

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eral miles north of Electric Beach. Although cable stations were once central workplaces that enriched and enlivened communities, today they are more often inaccessible buildings that bring little visible benefit to the surrounding area. This link to the information highway, shuttling signals between Asia and the United States, had neither on-ramps nor off-ramps as it extended under the houseless people of the west shore. The station is located in the center of the town, next to an elementary school. Children play nearby, their voices filtering across the lawn, over heaps of trash in an adjacent lot, and through the station. When I visit the site, I am not surprised to see that it is abandoned and has bullet holes in its windows. Tyco Telecommunications encountered community resistance when it decided to lay cable beneath the town, and it could not afford to bring the cable ashore in Hawai'i because of the eventual bust of network development. The telecommunications worker who brought me here speculates that the station's heightened visibility and its proximity to the school intensified Tyco's difficulties.

This visit to O'ahu in 2009 was my introduction to the geography of undersea networks, and it remains a formative memory as I write this book. In O'ahu I first recognized the resolute materiality of network infrastructure and its entanglements with the turbulent histories of the Pacific, ranging from local cultural practices to large-scale projects of colonization and militarization. This propelled my journey across the Pacific to track the telegraph, telephone, and fiber-optic cable routes from North America (California, Oregon, Vancouver, and Washington) through islands that have been critical to transpacific networking (Fiji, Guam, New Zealand, Tahiti, and Yap) to economic centers across the ocean (in Australia, Hong Kong, Japan, the Philippines, and Singapore). At these sites, I traced the institutional histories of cable networks, documented their technological installations, and chronicled the range of cultural uses for cabled spaces. Cable routes are not only makeshift homes but also places for dumping trash, areas to be preserved and protected, sites for recreation, and even sacred grounds. Digging into the histories of our fiber-optic systems, I found that the currents of Internet traffic—often seen as flattening the Pacific Rim—have instead gained traction in its diverse cultural environments.

Papenoo, Tahiti

Two years later and a thousand miles south, I pull up to a second school on the island of Tahiti. By this time, my visits to cable stations have become routine. I look for an unmarked and nondescript industrial building with few windows, surrounded by surveillance cameras and guarded by barbed wire.

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Contemporary cable systems are critical to the functioning of our global information sphere—they transmit almost 100 percent of intercontinental Internet traffic—and are embedded in a landscape of security. Failing to find the station, I park on a dirt strip outside a school and wander into its open courtyard. Students pull at two ends of a long rope in a game of tug-of-war (figure P.2). I approach the woman watching these children and ask her about Honotua, Tahiti's first fiber-optic cable, which was laid earlier that year. She calls a young boy over from the yard. "Le câble!" she points. He runs toward the ocean and I follow, taking snapshots as I duck through the buildings. Arriving at the back of the school, I encounter a sight as striking to me as the rudimentary inhabitation of O'ahu's cable landing. Here stands a stone monument, about five feet tall. A large black plaque is mounted on its face. An inscription in Tahitian, English, and French reads:

> In memory of the people of Papenoo and of Hawai'i, who established ties in the past:
> Tapuhe'euanu'u from Tapahi, who, fishing from his canoe, caught Hawai'i the Great,
> Te'ura-vahine from Ha'apaiano'o, the goddess Pere, who sought refuge in the volcano of Hawai'i the Great,
> Mo'iteha, King of Hawai'i, who came back to Tahiti to build his marae Ra'iteha at Mou'a'uranuiatea,
> Ra'amaitahiti, his son, King of Tapahi, who brought his drum to Kaua'i,
> To revive these ancient connections, Honotua was made: The submarine cable that links Tahiti to Hawai'i.
> After quietly undulating in the deep sea, it has landed here, at Mamu (silence).
> Hopefully human ignorance will dissolve into silence and only knowledge will be conveyed.

This is the only landing point at which I have ever seen an active cable memorialized. Instead of being hidden, with only a manhole to indicate its location, Honotua is marked proudly for anyone to see. The plaque does not describe undersea cables as a new technology but instead highlights the continuity between the light waves that transmit information and the ocean waves that have carried islanders across the Pacific. Although in Hawai'i undersea cables were resisted by residents, who perceived them as part of a colonial legacy, in Tahiti cable infrastructure is displayed as an important site in local education, integral to the transmission of cultural knowledge. Regardless of what

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FIGURE P.2. A game of tug-of-war, Papenoo, Tahiti.

purpose the cable will actually be used for, this link is commemorated not simply because it hooks Tahiti into a global network, but also because it is seen as building on Tahitians' past cultural connections. The turbulent environments of Hawai'i, however, had created a ripple effect across the system, affecting the Tahitian cable's geography. Honotua could have landed on O'ahu, but the contentious spatial politics of the west shore meant that companies must bury cables there by drilling a conduit horizontally under the sand. This strategy of insulation keeps the cable out of view and doesn't disrupt local road traffic, but it reportedly costs over fifty times more than simply digging a trench, ultimately deterring Honotua's owners. Instead, this cable terminates on Hawai'i's big island, a new outpost for undersea networks, geographically separated from the historical concentration of transpacific systems. Cable networks not only build on past cultural connections, but they become entangled in contemporary cultural conflicts.

The link between two locations in a network, such as the connection between Hawai'i and Tahiti, is termed an "edge" in network theory, an appropriate term given that we rarely see beyond its horizon. Edges are often drawn as a simple line between two nodes, a vector that stands independent of time and place. Rather than take such connections for granted, this book moves through the environments of our undersea network, into the routing arrangements, cable stations, landing points, and subaquatic spaces in which links

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have been constructed. It focuses our attention on the geography of cable construction, operation, and contestation, and on the companies that are themselves caught in a tug-of-war between the need to insulate currents from their environments—via walls, beaches, or other protective measures—and to connect them with preexisting circulations of meaning and value. Exploring the materiality of such edges reveals how our undersea network, as well as the connections it enables, has been made possible only by the deliberate manipulation of technology, cultures, politics, and environments, all of which remain invisibly enfolded in the lines between nodes.

Statement on *Surfacing*

The Undersea Network weaves a set of narratives across our transoceanic cable systems, connecting rural cable stations with submarine ridges, remote islands to urban centers, and large-scale historical forces with localized conflicts. From each of these sites a network extends outward to a myriad of technologies, actors, and events. Every cable station connects to an undersea cable system, as well as to a set of culturally specific practices of operation. Each island is embedded in a broad social and political history. Even localized conflicts have been shaped by varied corporate and governmental actors. The following stories traverse only some of these vectors.

Surfacing, a digital map of undersea cables, draws readers deeper into these hidden networks. In this online system, the reader can dive into the photographic archives of individual cable routes, explore the local histories of cable stations and landing points, and navigate the numerous connections between nodes. *Surfacing* provides a nonlinear way to access our undersea network, one that is geographically rather than narratively oriented.

Surfacing connects to this book via a series of keywords—portals between print and geography—that are indicated at the beginning of each chapter in a concept map. To move to a site in *Surfacing*, simply type the keyword after "surfacing.in":

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